We are now enabled to give the names of those who have signed the Art Memorial.

Edward J. Poynter, P.R.A.
W. B. Richmond, R.A.
Fredk. Goodall, R.A.
G. W. H. Boughton, R.A.
Walter W. Ouless, R.A.
Ernest Crofts, R.A.
Thos. G. Jackson, R.A.
Hamo Thornycroft, R.A.
H. H. Armstead, R.A.
Harry Bates, A.R.A.
Alfred Gilbert, R.A.
Briton Riviere, R.A.
E. Onslow Ford, R.A.
William Holt, of Oldham.
John M. Jones.
W. P. Frith, R.A.
Frank Dicksee, R.A.
Phil. R. Morris, A.R.A.
George Frampton, A.R.A.
Hugh de T. Glazebrook.
Luke Fildes, R.A.
Val Prinsep, R.A.
Marcus Stone, R.A.
Colin Hunter, A.R.A.
G. F. Watts, R.A.
John R. Clayton.
Reginald Barratt.
Fredk. Smallfield.
Lewis F. Day.
Thos. J. Grylls.
Morant and Co.
L. Alma Tadema, R.A.
Andrew C. Gow, R.A.
Sydney P. Hall.
Alfred East.
John Charlton.
Oliver Murray, A.R.A.
C. E. Johnson.
J. Y. Hunter.
R. Phene Spiers, F.S.A.
Gordon Thomson.
John Tenniel.
Edmd. M. Wimperis.
Herbert Schmalz.
S. Melton Fisher.
Cyrus Johnson.
Frank Walton.
Ernest A. Waterlow, P.R.W.S.
Walter C. Horsley.
Charles Fowler.
J. D. Crace.
Edwin Bale, R.I.
M. R. Corbet.
Edith Corbet.
W. J. Hennessy.
H. R. Mileham.
James E. Grace.
Harold Rathbone.
H. R. Hope-Pinker.
H. Cecil Drane.
G. E. Wade.
Lionel Cust.
Walter McLaren.
Alfred Drury.
Fanny W. Currey.
W. Hounsom Byles.
L. Fairfax Muckley.
R. Falconer MacDonald.
Elinor Hallé.
J. Fitz Marshall, R.B.A.
May E. Gordon.
A. T. Yowell.
Mary Grace.
Henry T. Wells.
J. Calcott Horsley.
William F. Yeames.
Seymour Lucas.
Eyre Crowe, A.R.A.
G. D. Leslie.
Thos. Brock.
W. Holman Hunt.
Edward Burne-Jones.
Arthur Severn.
C. E. Hallé.
Thos. Stirling Lee.
Gleeson White.
Walter Crane.
Carlisle.
W. Q. Orchardson, R.A.

NOTES.

IN the presence of a brilliant and representative gathering of citizens, the freedom of the City of Edinburgh was conferred upon Lord Lister on Wednesday, June 15.

GERMANY owes most of her success in the commercial and industrial world to her readiness to act upon the advice of her men of science. The German Emperor has just given further evidence that he understands the value of scientific opinion in matters affecting national welfare, and recognises the importance of technical education, by nominating Prof. Slaby, of the Technical College at Charlottenburg, Prof. Launhardt, of the Technical College at Hanover, and Prof. Intze, of the Technical College at Aachen, to be life members of the Upper House of the Prussian Diet. The *Times* correspondent at Berlin states that while Prof. Slaby was delivering his lecture at Charlottenburg on Wednesday, he was interrupted by the receipt of a telegram from the Emperor, which he proceeded to read to his class. It was in the following terms:—"In recognition of the importance which technical knowledge has acquired at the end of our century, and in profound respect for the exact sciences in general, I wish to confer upon the Technical College of Charlottenburg a seat and a vote in the Herrenhaus, and I nominate you as the most fit person to be its representative.—William, I.R." Prof. Slaby, addressing the students, expressed his sense of the significance of the step which the Emperor had taken in conferring upon the technical colleges the right of representation in the Upper House of the Prussian Diet, a privilege which the Universities had long enjoyed.

THE preliminary programmes of the sections of the American Association for the Advancement of Science are beginning to be published. Section A (Mathematics and Astronomy) announces twenty-five papers, and reports of five committees. Section C (Chemistry) announces that on Tuesday, August 23, under the auspices of the American Chemical Society, the morning session will be devoted to the subject of analytical chemistry, led by Dr. P. De P. Ricketts, of Columbia University; the afternoon to teaching of chemistry, Dr. F. P. Venable, University of North Carolina. On Wednesday, August 24, the Association will make an excursion to Salem as guests of the Essex Institute. On Thursday, August 25, the morning will be given to inorganic chemistry, led by Dr. H. L. Wells, Yale University; the afternoon to organic chemistry, Dr. Ira Remsen, Johns Hopkins University; and the evening to physical chemistry, Dr. T. W. Richards, Harvard University. On Friday, August 26 (Harvard Day), in one of the Harvard University rooms, the subject of physiological Chemistry will be opened by Dr. E. E. Smith, New York; President Eliot will deliver an address to the Association at large in the evening. On Saturday, August 27, the morning will be given to agricultural chemistry, led by Dr. H. A. Weber, Ohio University; and the afternoon to technical chemistry, Dr. N. W. Lord, Ohio University.

THE issue of the *Revue Scientifique* of June 11 contains an interesting critical notice of the Royal Society's International Catalogue scheme by M. Charles Richet, a well-known expert in such matters. M. Richet fears that the apathy which the public manifest towards all such enterprises may make it difficult to obtain the necessary funds from subscriptions. He cordially welcomes the proposal to issue the catalogue in two forms—as slips and in book form—but regards the preparation of slips of the character suggested as a work of great difficulty on account of its magnitude. Being an ardent advocate of the Dewey system, he naturally deplores the fact that it has been put aside; but yet finally expresses his conviction that all advocates of the system will rally, without hesitation, to the system proposed by the Royal Society, which, being advocated by such a body, has the greatest chance of success. Of the scheme as a whole, M. Richet writes: "C'est une belle œuvre à accomplir: et le plan est excellent, dans son ensemble. Nous espérons donc fermement que tous les savants de France et de l'étranger prêteront leurs concours actif à cette magnifique publication." If all receive the proposals in the same generous spirit of appreciation and self-abnegation, there can be little doubt of the success of the enterprise.

PROF. O. C. Marsh, Yale University, New Haven, has been elected a Foreign Member of the Geological Society.

PROF. B. GRASSI, M. Hippolyte Lucas, and Dr. August Weismann have been elected honorary members of the Entomological Society of London.

THE death is announced, at the age of seventy-two, of Sir James Nicholas Douglass, F.R.S., late Engineer-in-Chief to the Hon. Corporation of Trinity House. During his tenure of this post he carried out many important engineering works both at home and abroad, such as the Wolf, Longships, Great and Little Basses, Eddystone, and Muricoy lighthouses, and he effected numerous technical improvements connected with lighthouses and their illuminating apparatus, as well as in buoys and beacons. He was elected a Fellow of the Royal Society in 1883, and retired from his post at the Trinity House in 1892.

THE *Times* reports that the Norwegian Geographical Society gave a banquet last Saturday to the expedition under Captain Sverdrup, which is on the point of leaving for exploration along the north and north-west coast of Greenland. Several of the Norwegian Ministers were present, as well as the Presidents of the two Houses of Parliament, Dr. Nansen, Prof. Mohn, and other distinguished men.

AN international fisheries exhibition, together with an exhibition of Norwegian industry, agriculture, art and home industries, is now open at Bergen. The directors of the Society for promotion of Norwegian fisheries are of opinion that besides the many various meetings which will take place during the exhibition, an International Fisheries Congress ought, if possible, to be arranged. They therefore invite Norwegians as well as foreigners interested in fisheries to join in such a Congress, to be held in Bergen on July 18–21.

ACCORDING to a report of the French Minister at Stockholm, referred to in the *Board of Trade Journal*, the industry of textiles made from peat-fibre has just been introduced into Sweden. The fibres, produced from peat by a mechanical process, can be mixed in the proportion of 75 per cent. with pure wool, for the manufacture of yarn similar in appearance to common woollen yarn.

THE Pilot Chart of the North Atlantic Ocean, issued by the United States Hydrographic Office for the month of June, shows that the ice season has now set in on the Grand Banks, and that the amount of icebergs is equal to the average of past years. In addition to the ordinary useful information there is a sub-chart showing the distribution of atmospheric pressure and the prevailing winds in the South Atlantic, taken, with some modifications, from the Meteorological Atlas of the Deutsche Seewarte. It shows that a belt of high pressure extends east and west along the parallel of 25° S. To the southward the pressure diminishes rapidly and with great uniformity, and the decrease is continuous as far towards the pole as observations have been carried. Some useful general remarks are made as to the system of winds to which this high pressure area gives rise in various seasons of the year.

IN the last annual number of the *Journal of the Scottish Meteorological Society* (vol. xi.), Dr. Buchan has published a most important paper on the mean atmospheric pressure and temperature of the British Islands, with twenty-six coloured maps and tables of monthly and yearly values for forty years, 1856–1895. Fifteen years ago similar data for twenty-four years were published, but since that date a large number of stations have been added, the total now reaching 400, and a more satisfactory inspection of stations has been brought about, chiefly by the valuable aid rendered by the Meteorological Council, so that better averages are now obtainable. This monumental work teems with interesting and strictly trustworthy results, but we can only briefly refer here to one or two general remarks pointed out in the author's instructive discussion. The most striking feature is the down-curving of the annual isobaric lines as they cross the Irish Sea and St. George's Channel. Another distinct feature of the isobars is the influence of the land in increasing the barometric pressure, and the opposite influence of the sea in depressing the isobars. In the discussion of the temperature observations the author arrives at a conclusion of great importance for invalids, viz. that where a winter climate is sought, offering, in the highest degree the combined qualities of mildness and dryness, anywhere afforded by the British Islands, such a climate is to be found on the shores of the Channel, from about Dover to Portland.

MR. W. ERNEST COOKE, Government Astronomer of Western Australia, has forwarded to us particulars received from Captain Odman with regard to a remarkably severe storm experienced off the north-west coast of Australia between March 30 and April 3. Captain Odman was commanding the S.S. *Albany*, and evidently passed right into the "eye" of the storm. Strong north-east winds were met on April 1, and the barometer fell until 10 a.m. of the following day, when the weather became calm. An hour later the barometer rose quickly, and south-west winds were experienced. The following extracts from the log are instructive, as showing the characteristics of wind and atmospheric pressure in a rotary storm:—April 1, lat. 19·00, 12 a.m., barometer 29·58, strong N.E. winds and clear; 3 p.m., barometer 29·48, blowing N.E. gale with heavy rains; 11 p.m., barometer 29·42, wind N.E., blowing and raining, the force of the wind being indescribable, and continuing with fearful hurricane force up to 10 a.m. on 2nd. April 2, lat. 20·00, 10 a.m., barometer 27·80, suddenly and without warning it became calm; in fact, we could not feel a breath of wind, or tell from which direction it came. The barometer then stood at 27·80, and continued stationary till 11 a.m, when it suddenly rose to 27·90, and the wind could be heard roaring and the sea-boiling before we felt it, when it suddenly struck the ship from S.W., in an entirely opposite direction to that previously experienced, and, with the rain, became almost as dark as night, and continued to blow at much greater hurricane force than it had done before, the barometer still rising. The gale still continued with violent force up to midnight, the barometer still rising and the wind decreasing from then. Captain Odman states as a positive fact that the men's dungaree suits and his own canvas one were blown to ribbons during the storm. The barometer fell an inch between 6 and 10 a.m. on April 2, and rose an inch again by 6 p.m. Mr. Cooke informs us that the storm struck the towns of Cossack and Roeburne, and almost demolished them. Cossack registered 15·42 inches of rain, Roeburne 14·66, and a place called Whim Creek had 36·53 inches. Mr. Cooke failed, however, to trace the storm inland. He expected it to work overland towards Eucla, at the head of the Great Australian Bight, but no traces of it were perceptible at the inland meteorological stations.

IT may be remembered that in May of last year Dr. Le Neve Foster, F.R.S., nearly met his death by carbonic oxide poisoning while investigating the circumstances attending an underground fire at the Snaefell Lead Mine, Isle of Man (see NATURE, vol. lvi. p. 58). A detailed report upon this mine accident has just been published in a Blue Book, and it is not merely a statement of facts as to the condition of the mine and the method of working, but a document containing information which will prove of service to persons exposed to the risk of carbonic oxide poisoning, and also be of scientific interest to physiologists. Dr. Foster points out that although the gas occurs occluded in certain rocks and minerals, it has never been found as a natural constituent of the atmosphere of mines. He had, therefore, to seek for some artificial source of the poison when investigating the accident, and he found sufficient evidence to justify the conclusion that the deaths of the twenty victims of the Snaefell disaster were due to carbon monoxide produced by timber burning in the mine. It is startling to find how small a quantity of timber need be burnt to pollute to a dangerous extent the passages of a mine. By the combustion of a cubic foot of larch, which was the kind of timber employed at Snaefell, enough carbon monoxide is produced to occupy 417 cubic feet of space at a temperature of 60° F., and a pressure of 30 inches. Twenty-five cubic feet of timber contain carbon enough to produce sufficient carbon monoxide to give an atmosphere with 1 per cent. of the noxious gas all through the mine, which proportion is quite sufficient to cause almost immediate loss of consciousness, followed speedily by death. Dr. Foster therefore recommends that the linings and fittings of all mine shafts and roadways in mines should be made fire-proof, or of fire-resisting materials, unless the shafts and roadways are decidedly wet or damp. The use of oxygen in restoring sufferers from carbonic oxide poisoning is referred to, and the suggestion is made that a supply of compressed oxygen should be available in every district, and also apparatus for penetrating into noxious gases. With Dr. Foster's report is a report by Dr. Miller upon physiological effects of carbon monoxide poisoning, and an appendix containing statements concerning the sensations, symptoms, and after-effects produced by breathing the gas.

DR. ISSATSCHENKO, of the bacteriological laboratory attached to the agricultural department of the Russian Government, has just made a preliminary communication on a new microbe pathogenic to rats which he has discovered. A disease, which assumed epidemic proportions, broke out amongst the rats kept for experimental purposes in the laboratory, and from the liver and spleen of affected animals a bacillus was isolated, which proved on inoculation to be extremely fatal as regards both rats and mice. Receiving food infected with this organism rats and mice invariably succumbed, the former after from eight to fourteen days, the latter after from four to eight days. Following Pasteur's example in the case of a bacillus similarly fatal to rabbits, attempts were made to turn this new microbe to practical account and utilise it as a living rat poison. The results so far have not been very encouraging, but further experiments are being made in this direction. It is apparently quite without effect upon pigeons and rabbits. As regards its artificial cultivation this microbe is very accommodating, growing luxuriantly upon all the customary culture media with the exception of potatoes. In microscopic appearance it varies, as is so often the case, according to the nature of the medium in which it has been previously grown. It is mobile, and is endowed with lateral flagella.

INCREASING attention is paid nowadays to the elevation and sub-soil by those who are in a position to choose their place of residence. It is true that many circumstances have to be taken into consideration in fixing upon a home, and not the least important is the construction of the house itself—more important, probably, than the question of a gravel or clay sub-soil. Elevation and surroundings, again, may confer advantages not to be had in a low-lying gravel area. To those, however, who are seeking for homes on particular sub-soils or in particular situations the handsome embossed model just published by Mr. E. Stanford, London, will prove an excellent general guide. If the more elevated regions of Shooter's Hill, Sydenham and Wimbledon, of Hampstead, Highgate and Harrow, appear to stand out in somewhat mountainous form, owing to the horizontal scale of one inch to a mile and the vertical scale of one inch to a thousand feet, the main features can nevertheless be readily grasped. The leading roads and railways are shown, the sub-soils are distinctly coloured, and along the margin of the model there are sections depicting the underground structure of the country. The model itself measures 2 feet by 1 foot 8 inches, including its frame, and it takes in Barking on the north-east, a part of Harrow on the north-west, Long Ditton on the south-west, and Orpington on the south-east. The model is made of tinned steel plate, enamelled in colours, and its price is 15*s*. It has been prepared by Mr. James B. Jordan, the geology being compiled from the maps of the Geological Survey, the work chiefly of Mr. Whitaker. House-hunters who consult it will see at a glance the advantages to be gained from certain localities, and also the districts that should, if possible, be avoided. For educational purposes in schools the model may prove of considerable service.

AN interesting address entitled "Types of Scenery and their Influence on Literature," recently delivered at Oxford by Sir Archibald Geikie as the Romanes Lecture, has been published by Messrs. Macmillan and Co., Ltd. The object of the address was to point out the leading types of scenery that distinguish the British Isles, and to show that it is possible to trace from each of them an influence upon the growth of English literature. For instance, Sir Archibald points out that the English lowlands have had a distinct influence upon our literature. They are washed by the sea along the whole of their eastern and northern borders. Moreover, the coastline is indented by numerous bays, creeks, and inlets, which furnish many admirable natural harbours. There can be no doubt that this feature in our topography has powerfully fostered that love of the sea which has always been a national characteristic. To the same cause may be traced that appreciation of the poetry of the sea so noticeable in our literature. For a century after Milton's time poetry became with each generation more polished and artificial. When at last a reaction set in, the impulse that led to the most momentous revolution in the history of English poetry came in large measure from the writings of three poets, each of whom drew his inspiration from lowland scenery—Cowper, Thomson, and Burns. The uplands, which include the border country of England and Scotland, produced the Border ballads, and the highlands of Western Argyleshire are portrayed in Macpherson's "Ossian"; while the Lake District, also mountainous, claims attention for its influence on the progress of national literature, for it was amidst its scenery that William Wordsworth was born and spent most of his long life. Towards the end of his interesting address Sir Archibald Geikie remarks:—"It is curious to remember that three of the poets whom I have singled out as illustrations of the influence of our lowland, upland, and highland scenery upon our literature have held up the geologist to ridicule. Cowper put that votary of science into the pillory among the irreligious crowd, about whose ears the poet loved to 'crack the satiric thong.' Wordsworth treated the geological enthusiast with withering scorn. Scott, with his characteristic good humour, only poked fun at him. It was reserved for a poet of our own day to look below the technical jargon of the schools, and to descry something of this wealth of new interest which the landscape derives from a knowledge of the history of its several parts. But Tennyson only entered a little way into this enlarged conception of nature. There remains a boundless field for some future poetic seer, who, letting his vision pierce into the past, will set before the eyes of men the inner meaning of mountain and glen."

THE twenty-sixth annual report of the Board of Directors of the Zoological Society of Philadelphia has been received. The number of visitors to the Gardens of the Society during the year covered by the report was 173,999. In addition to this, 125,000 free tickets were issued to the Board of Education for the admission of pupils of the public schools. The Society's collection of animals numbers 1019, of which 339 are mammals, 421 birds, 238 reptiles, and 21 batrachians. Among the additions to the collection were two young West Indian seals (*Monachus tropicalis*). Although the existence of a peculiar species of seal in the Caribbean Sea has been known for several centuries, no detailed description has been given of it until very recently, and no living specimens had been procured until a schooner was sent out last spring by a firm of merchants for the purpose of capturing some, which was finally effected on a small coral reef off the Campeachy coast of Yucatan. These animals were distributed among various zoological collections, and three were secured by Philadelphia. It was hoped that observations might be made upon the habits of this almost unknown species, but unfortunately, in all these cases, the animals were induced to take food with difficulty and in small quantity, and they lived only a short time. The genus *Monachus* includes the present species and one other found in the waters of the Mediterranean, these seals being the only ones belonging to the *Phocidæ*, or the group without external ears, which are found in subtropical regions of the Atlantic. Referring to the death of a male orang belonging to the Society, it is noted that though it has more than once been pronounced by high authority to be anatomically impossible for the orang to maintain an erect attitude without touching some means of support, this animal was repeatedly observed walking about his cage in an absolutely erect position without having his hands in contact with any fixed object.

Writing in the annual volume of the *Sitzungsberichte der physikalisch medicinischen Societät in Erlangen*, Prof. E. Wiedemann and Dr. G. C. Schmidt give some noteworthy observations on the electric properties of gases. In the first of their papers the authors discuss the absorption of electric oscillations by gases, and arrive at the somewhat remarkable result that gases which are excited to incandescence by electric discharges will absorb electric waves falling on them, even when they would not do so if unexcited; but the dark space surrounding the kathode is only feebly absorbent of such oscillations, thus behaving like a non-conductor. Prof. Wiedemann and Dr. Schmidt also discuss the effects of Goldstein's rays ("kanalstrahlen") on electric oscillations, and find that the oscillations emanating from a Lecher condenser are absorbed by gases which have been excited by these rays.

In a second paper, Prof. Wiedemann and Dr. Schmidt discuss the view that the conduction of electricity through rarefied gases is an electrolytic phenomenon. This view is negatived by their present observations. In some cases, as with chloride, bromide and iodide of mercury, no products of electrolysis appeared at the electrodes; in other cases, where decomposition did take place, the amounts liberated were found not to follow Faraday's Law. In a further communication to the same journal, Dr. G. C. Schmidt discusses the relation between fluorescence and photo-electric susceptibility; the results of these observations do not altogether favour the hypothesis of Elster and Geitel as to a parallelism between the two phenomena.

Some of the catalogues published by many photographic firms, besides containing useful information on photographic lenses, cameras, shutters, &c., are really works of art of no mean merit. We have just received the fourth edition of Messrs. Newman and Guardia's catalogue, which quite falls into this category if one examines the series of illustrated specimens of the work done with their so-called "N. and G." cameras. The beauty of these reproductions will be fully appreciated by all who peruse this book, the half-tone blocks having been produced by the Swan Electric Engraving Company.—Messrs. Ross, Ltd., have also forwarded to us their catalogues for the present year, containing a mine of information about lenses, cameras, &c., of every conceivable kind, and many other optical instruments which this firm manufactures.

In the *Bollettino della Società Sismologica Italiana* (vol. iii. No. 8) a list of earthquakes observed in Greece during the year 1897 (January–June) is given by S. A. Papavasiliou, in continuation of the catalogue compiled by the author before his retirement from the observatory at Athens. The number of shocks recorded during the six months is about 130. Other papers are:—A new contour-map of the central crater of Etna, by A. Riccò; seismoscope with clock, by C. Guzzanti, describing an arrangement for starting mechanically a clock, previously set at a known time; seismology and palæography, by E. Oddone; notices of earthquakes recorded in Italy (May 23-June 11, 1897), by G. Agamennone, the most important being the Ionian Sea earthquake of May 28-29, and earthquakes of distant origin on May 23-24, 24-25, and June 3.

A new part (vol. ii. Isopoda, part ix. x.) of Prof. G. O. Sars' monograph on the "Crustacea of Norway" has just been issued by the Bergen Museum. The Munnopsidæ are concluded in this new part, which also contains descriptions of members of the tribe of Oniscoida, four families of which are represented in the fauna of Norway.

The second volume of the Cape Photographic "Durchmusterung," by Dr. David Gill, F.R.S., and Prof. J. C. Kapteyn, has just been published as vol. iv. of the *Annals of the Cape Observatory*. The arrangement of the stars in the catalogue is precisely similar to that of vol. i., recently reviewed in these columns (p. 513). The new volume contains the positions of stars in the zones −38° to −52°.

Mr. T. Chalkley Palmer has an interesting note in the *Proceedings* of the Academy of Natural Sciences of Philadelphia, on the peculiar movements of the diatom *Eunotia major*, which he considers to be connected with an actual process of assimilation or elimination of oxygen, and to be produced by special pseudopode-like organs; these he calls "coleopodia," and he believes them to be present also in other diatoms belonging to the Fragilarieæ.

The fourth German edition of Dr. A. Classen's work on "Quantitative Chemical Analysis by Electrolysis" differs from the previous editions in several respects, among which may be mentioned the insertion of a section devoted to theory, and the addition of descriptions of various measuring instruments and electrolytic experiments. The revision was carried out with the assistance of Dr. W. Löb; and the authorised English translation of the revised and enlarged edition, prepared by Prof. W. H. Herrick and Dr. B. B. Boltwood, has been published by Messrs. J. Wiley and Sons (London: Chapman and Hall, Ltd.). The book is a more complete, scientific and logically arranged work than heretofore, and is altogether a useful manual on electro-chemical analysis. The illustrated account of the Electro-chemical Institute at Aachen, where Drs. Classen and Löb are at work, should lead to the foundation and equipment of similar institutions here for purposes of instruction and research in this most important branch of science. It should not be left to Germany to extend and apply the principles discovered by Davy and Faraday.

Reports of papers read before the Royal Society of Edinburgh regularly appear in the columns of Nature shortly after the papers are read, so it is unnecessary to do more now than briefly refer to the papers which appear in their complete form in the *Transactions* of the Society for the sessions 1895-96, 1896-97. Among the subjects and authors of papers in the volumes are the following:—Observations on the phonograph, by Prof. J. G. M'Kendrick; the strains produced in iron, steel, and nickel tubes in the magnetic field, by Prof. C. G. Knott; the temperature variation of the magnetic permeability of magnetite, by Dr. E. H. Barton; the weather, influenza, and disease, by Dr. A. Lockhart Gillespie; torsional oscillations of wires, by Dr. W. Peddie; the meteorology of Edinburgh (two papers), by Mr. R. C. Mossman; some nuclei of cloudy condensation, by Mr. John Aitken (in this paper Mr. Aitken shows, by experiments on the effect of sunshine on the gases in the atmosphere, that it is possible for cloudy condensation to take place in the absence of dust); the fossil flora of the Yorkshire coal-field, by Mr. Robert Kidston; and the automatic linear transformation of a quadric, by Dr. Thomas Muir. The *Proceedings* of the Society (vol. xxii.) contain several papers by Lord Kelvin; notes on specimens of rock from the Antarctic Regions, by Sir Archibald Geikie; observations of instrumental disturbances at the Colaba Observatory during the Indian earthquake of June 12, by Mr. N. A. Moos; the velocity of graded actions, by Dr. James Walker, and other papers.

THE additions to the Zoological Society's Gardens during the past week include a Guinea Baboon (*Cynocephalus sphinx*) from West Africa, presented by Captain C. C. Wyatt; three Common Marmosets (*Hapale jacchus*) from South-east Brazil, presented by Colonel A. H. Maclean; two White-tailed Gnus (*Connochœtes gnu*, ♂ ♀) from South Africa, presented by Mr. C. D. Rudd; a Cape Zorilla (*Ictonyx zorilla*), a Little Ichneumon (*Helogale parvula*), a Spotted Eagle Owl (*Bubo maculosus*) from South Africa, presented by Mr. J. E. Matcham; two South African Kestrels (*Tinnunculus rupicolus*) from South Africa, presented by Mr. C. Southy; a Naked-footed Owlet (*Athene noctua*), European, presented by the Hon. Mrs. Barrington; two Senegal Parrots (*Pœocephalus senegalus*) from West Africa, presented by Miss E. L. Barford; four Fieldfares (*Turdus pilaris*), a Black Guillemot (*Uria grylle*) from Christiansund, North Norway, presented by Dr. R. B. Sharp; an Indian Python (*Python molurus*) from India, presented by Mr. Percival F. Tuckett; a Four-lined Snake (*Coluber quatorlineatus*), European, presented by Mr. J. W. Temple; twelve Algerian Skinks (*Eumeces algeriensis*) from Algeria, presented by Mr. Robert S. Hunter; a Malabar Squirrel (*Sciurus maximus*, var. *dealbatus*) from India, two Forster's Ceratodus (*Ceratodus forsteri*) from Australia, deposited; a Crowned Partridge (*Rollolus cristatus*) from Malacca, four Common Cormorants (*Phalacrocorax carbo*) from Holland, two Cereopsis Geese (*Cereopsis novæ-hollandiæ*), two Forster's Ceratodus (*Ceratodus forsteri*) from Australia, purchased; three Triangular-spotted Pigeons (*Columba maculosa*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN.

COMETS NOW VISIBLE.—Last week it was noted in these columns that Mr. Coddington had discovered a comet in the position R.A. 16h. 24m. 45·9s., and Declination (South) 25° 14′ 20″. Circular (No. 7) of the *Centralstelle* gives the elements and ephemeris of the comet, based on the positions observed on June 11, 13 and 15, and calculated by Prof. A. Berberich. The former are as follows:—

T = 1898 August 4·478 Berlin M.T.

$$\left.\begin{aligned}\omega &= 206^\circ\ 8'{\cdot}5\\ \Omega &= 73\ \ 58{\cdot}7\\ i &= 76\ \ 48{\cdot}3\end{aligned}\right\}1898{\cdot}0$$

$$\log q = 0{\cdot}31850$$

As the comet is moving rapidly south, and has now a Declination (South) of about 32°, we do not give the ephemeris. This comet was independently discovered by Dr. W. Pauly in Bucharest on June 14.

We have received two telegrams from Kiel concerning another comet, Perrine (June 14). The former gives the observation made on June 14 at Lick mean time 15h. 16·0m., giving the position Right Ascension 3h. 29m. and Declination + 58° 36′, the latter showing the position to be Right Ascension 3h. 34m. 58s. and Declination + 58° 24′ 2″ at Lick mean time 14h. 12m. on June 15. A Circular (No. 5) from the *Centralstelle* gives us the elements and ephemeris calculated by Perrine and Aitken from the observations made on June 14, 15 and 16. These are:—

Elements.

T = 1898 August 17·40 Greenwich M.T.

$$\left.\begin{aligned}\omega &= 196^\circ\ 46'\\ \Omega &= 260\ \ \ 6\\ i &= 69\ \ 42\end{aligned}\right\}1898{\cdot}0$$

$$q = 0{\cdot}7418$$

Ephemeris for 12h. Greeenwich M.T.

1898.	R.A.	Decl.	Br.
	h. m. s.	° ′	
June 20	4 2 52	+57 15	1·18
24	4 25 24	55 56	
28	4 48 48	54 20	
July 2	5 10 0	+52 27	1·72

The comet will thus gradually brighten as July is approached, but takes a somewhat southerly course.

Another Kiel telegram, dated June 18, tells us that Perrine found Wolf's comet on June 16, at 15h. 5·3m. Lick mean time, in position—

R.A. 2h. 16m. 19s., and Declination + 19° 42′ 44″.

Still another and last telegram from Kiel, dated June 19, informs that comet Giacobini was seen on June 18 at 13h. Nice mean time in the position of Right Ascension 20h. 36m. 30s. and Declination − 21° 14′ 0″.

THE 40-INCH YERKES REFRACTOR.—Prof. Barnard, writing in the *Astronomical Journal* (No. 436) with respect to a series of measures of the satellite of Neptune, gives an interesting account of the behaviour of the Yerkes telescope. Actual observation was not possible until the best season was essentially over, but it was found that even a part of this unfavourable weather permitted the power of the telescope to be tested. On one or two occasions, when observing double stars, he was able to use powers of several thousand diameters, and on one date he employed a power of 3750 with good success. The object-glass he finds entirely free from any form of ghost, and the definition is at times very good, showing, as he says, that "this last great work of Alvan Clark is one of his noblest monuments." The driving clock moves the great tube with such perfect steadiness that he was astonished at the result, and so stable is the mounting of the instrument that the effect of the clock, rewinding itself automatically at periods of 1h. 48m., does not in the least interfere with micrometer work. Very satisfactory also are the electrical contrivances at the eye end for clamping and slow motion; the clock takes up the tube upon the application of the electric clamp in Right Ascension perfectly instantaneously, and the slow movement is so exact that a star can be brought from the edge of the field and stopped instantly behind the micrometer-wire, the motion being about 1′ in 8 seconds. Prof. Barnard further mentions the ease with which the instrument can be handled; as an instance, he says that he placed the telescope on the west side of the pier in position of + 50° declination, and by means of the electric motors he moved it on the other side of the pier to the same Declination in 1m. 50s. An important addition to the dome is the wind-break. This consists of two curtains working on endless chains, one rising from the base of the slit, and the other passing through the zenith from the rear. With these, excepting at low altitudes and right in the face of the wind, the tube is always perfectly protected even on the windiest nights.

VARIABLE STARS OF SHORT PERIOD.—Prof. E. C. Pickering describes in a *Harvard College Observatory Circular* (No. 29) a very simple means of detecting variables whose periods are short if the observer is provided with a telescope mounted equatorially and a fairly good driving clock. The method is so simple and complete that it has probably been tried before, although, so far as we know, no mention of it has come under our notice. The idea is to expose a photographic plate in a telescope, the clock of which is working somewhat fast, and at intervals of ten and fifty minutes to alternately expose and cover the lens by an electrical attachment. Prof. Pickering describes one of the plates so exposed. An 8 × 10 plate was exposed in a telescope with a Cooke anastigmatic lens, aperture 2·6 cm. and focal length 33·3 cm. and eight successive images of each star were obtained in the period of about eight hours. The plate covered a region of about 33° square, and a portion of it, shown in the *Circular*, indicates the variable intensity of the images of the star U Cephei, while those of the neighbouring stars show no such variations.

On this scale forty plates would cover the whole sky from north to south pole, and Prof. Pickering proposes to undertake this work as soon as the best method of taking the plates has been determined. By the above plan it is hoped to secure a complete list of all variable stars of short period brighter than the ninth magnitude at maximum, whose variation exceeds half a magnitude, and whose period is less than a day. In such a sweep, probably, many other variable stars of longer period, and stars of the Algol type will be discovered.

The beauty of the above method lies in the simple equipment that is necessary to obtain results of considerable value. It will be noticed that the method is a differential one, clouds passing across the field of view during an exposure affecting all the photographic images alike.